

# Mineral Industry Surveys

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## FLUORSPAR IN THE FOURTH QUARTER 2006

Reported fluorspar consumption in the fourth quarter was 91,400 metric tons (t), a decrease of nearly 41% compared with that of the previous quarter and a 23% decrease compared with the figure for the fourth quarter of 2005. Consumption of fluorspar for hydrofluoric acid (HF) and aluminum fluoride was only 75,000 t, nearly a 44% decrease compared with that of the previous quarter and about 29% lower than in the fourth quarter of 2005. Imports of fluorspar were 122,000 t, a decrease of 26% compared with those of the previous quarter but about the same amount as was imported in the fourth quarter of 2005.

Some of the values reported by the U.S. Census Bureau for acid-grade fluorspar imports were missing insurance and freight costs. For the specific shipments that were missing these costs, adjustments were made by incorporating estimated freight costs derived from industry sources or published prices from trade journals. These adjustments are included in the import values for specific countries and affect all quarters and totals in table 3.

### National Defense Stockpile

At the end of the fourth quarter 2006, the Defense National Stockpile Center (DNSC) reported that quantities of unsold stockpile material remained unchanged at 8,945 short dry tons (SDT) (8,115 t) of metallurgical-grade fluorspar. Material committed for sale pending shipment totaled 11,629 SDT (10,550 t) of metallurgical grade.

### Industry News

China reduced its 2007 total export quota for fluorspar to about 685,000 t from 710,000 t in 2006. The first public bidding for export quotas on 342,500 t of fluorspar for 2007 was held on December 15, 2006. The export license fees averaged RMB220 or about \$28 per metric ton.

Hastie Mining Co. and Moodie Mineral Co. conducted additional drilling in the fourth quarter on the Klondike vein deposit in Livingston County, KY. Drilling completed through the early winter 2006-07 identified about 1.5 million metric tons of reserves with an average ore grade of 60% CaF<sub>2</sub>. The vein reportedly has an average width of 9 meters and extends to depths of 60 meters or more. Additional drilling was scheduled for the spring of 2007. Hastie had hoped to begin mine

production from the deposit by late 2007, but weather-related delays in the drilling program may push this back into 2008 (Jimmy Watson, Hastie Mining Co., oral commun., March 13, 2007).

Tiberon Minerals Ltd., majority partner of the Nui Phao fluorspar-tungsten project in Vietnam, announced that it had received a takeover offer (valued at about \$217 million) from Dragon Capital Management Ltd. and that Tiberon's Board of Directors determined the offer was fair and recommended that Tiberon shareholders accept the offer. Dragon Capital is a Vietnamese investment bank that manages several Vietnam-focused investment funds. At the time of the offer, Dragon Capital already owned about 12% of Tiberon's shares (Tiberon Minerals Ltd., 2006§<sup>1</sup>). In a subsequent announcement, Dragon Capital reported that a majority of Tiberon's shareholders had accepted of the offer by its expiration date of February 9, 2007 (Tiberon Minerals Ltd., 2007§).

### Fluorochemical News

Solvay S.A. announced that it was forming a joint venture to produce HF in China with Zhejiang Lantian Environmental Protection Hi-Tech Co. Ltd. Pending the relevant regulatory approvals, the joint venture was scheduled to begin operating in 2007 under the name Zhejiang Lansol Fluorchem Co. Ltd. A 20,000-metric-ton-per-year HF plant will be located in the Zhejiang Quzhou Hi-Tech Industrial Park, about 500 kilometers southwest of Shanghai. The plant's production primarily will be used to supply feedstock to Lantian and Solvay's downstream fluorochemicals operations, such as Solvay's fluoropolymer production unit under construction in Changsu, China, and its fluorinated chemical specialties plant under construction in Onsan, Republic of Korea (Tardy, 2006§).

INEOS Fluor Ltd. and Zhejiang Xing Teng Chemical Co. Ltd. announced the formation of a joint venture—Jiangxi In-Tech Chemical Co. Ltd.—to produce anhydrous HF. The new company will be based in Shangrao, Jiangxi Province, China, and the HF plant is expected to be operational by the end of

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<sup>1</sup>References that include a section mark (§) are found in the Internet References Cited section.

2007. The plant will supply INEOS Fluor's fluorochemicals plant in Mihara City, Japan, and Zhejiang Xing Teng's fluorochemicals business (INEOS Fluor Ltd., 2007§).

DuPont Refrigerants, Honeywell International Inc., and INEOS Fluor have each introduced new fluorine-base automobile refrigerants within the past year. These refrigerants are still undergoing testing, but are designed to allow automobile manufacturers to comply with the requirements of the European Union F-Gas Directive. This directive calls for the eventual phaseout of fluorine-based refrigerants with global warming potential (GWP) greater than 150 in mobile air-conditioning systems. GWP is a measurement of the heat-absorbing ability of each gas relative to that of carbon dioxide, which has a GWP of one.

## Internet References Cited

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- Tiberon Minerals Ltd., 2007 (February 12), Dragon Capital offer for common shares of Tiberon Minerals Ltd. accepted by holders of more than 90% of Tiberon common shares, accessed February 21, 2007, via URL <http://www.tiberon.com/pages/news/pressReleases.html>.

TABLE 1  
SALIENT FLUORSPAR STATISTICS<sup>1</sup>

(Metric tons, unless otherwise specified)

	2005	2006				
	Fourth quarter	First quarter	Second quarter	Third quarter	Fourth quarter	Total
Imports for consumption:	120,000	181,000	83,800	165,000	122,000	553,000
Average value per ton, c.i.f. U.S. port, acid grade <sup>2</sup>	\$210	\$221	\$214	\$211	\$219	\$216
Average value per ton, c.i.f. U.S. port, metallurgical	\$94	\$104	\$96	\$100	\$111	\$103
Exports	4,430	3,850	3,790	3,060	2,300	13,000
End of quarter stocks, consumer	80,800	109,000	78,200	103,000	79,400	XX
Fluorspar equivalent of imported hydrofluoric acid	53,100	60,900	56,500	56,100	60,600	234,000
Fluorspar equivalent of imported cryolite	707	1,640	1,100	1,100	880	4,750
Quarterly reported fluorspar consumption	119,000	143,000	135,000	154,000	91,400	523,000

XX Not applicable.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Average values per ton have been adjusted by the USGS using published prices and data from industry sources and may not agree with values calculated strictly from U.S. Census Bureau data.

TABLE 2  
CONSUMPTION OF FLUORSPAR BY END USE AND ASSAY RANGE<sup>1</sup>  
(DOMESTIC AND FOREIGN) IN THE UNITED STATES

(Metric tons)

End use or product	First quarter 2005			Second quarter 2005			
	More than 97% calcium fluoride	Not more than 97% calcium fluoride	Total	More than 97% calcium fluoride	Not more than 97% calcium fluoride	Total	
Hydrofluoric acid and aluminum fluoride	139,000	--	139,000	136,000	--	136,000	
Metallurgical	6,710	8,700	15,400	4,240	10,100	14,300	
Other uses or products <sup>2</sup>	5,140	--	5,140	7,250	--	7,250	
Total	151,000	8,700	160,000	147,000	10,100	157,000	
Stocks, end of quarter <sup>3</sup>	116,000	13,700	130,000	87,300	8,010	95,300	

End use or product	Third quarter 2005			Fourth quarter 2005			2005 Year to date
	More than 97% calcium fluoride	Not more than 97% calcium fluoride	Total	More than 97% calcium fluoride	Not more than 97% calcium fluoride	Total	
Hydrofluoric acid and aluminum fluoride	127,000	--	127,000	106,000	--	106,000	508,000
Metallurgical	4,290	6,940	11,200	4,350	3,310	7,660	48,600
Other uses or products <sup>2</sup>	7,200	--	7,200	5,310	--	5,310	24,900
Total	138,000	6,940	145,000	116,000	3,310	119,000	582,000
Stocks, end of quarter <sup>3</sup>	98,000	10,800	109,000	69,600	11,200	80,800	80,800

End use or product	First quarter 2006			Second quarter 2006			
	More than 97% calcium fluoride	Not more than 97% calcium fluoride	Total	More than 97% calcium fluoride	Not more than 97% calcium fluoride	Total	
Hydrofluoric acid and aluminum fluoride	123,000	--	123,000	113,000	--	113,000	
Metallurgical	4,160	8,160	12,300	4,520	8,880	13,400	
Other uses or products <sup>2</sup>	8,080	--	8,080	8,520	--	8,520	
Total	135,000	8,160	143,000	126,000	8,880	135,000	
Stocks, end of quarter <sup>3</sup>	93,700	15,600	109,000	53,900	24,300	78,200	

End use or product	Third quarter 2006			Fourth quarter 2006			2006 Year to date
	More than 97% calcium fluoride	Not more than 97% calcium fluoride	Total	More than 97% calcium fluoride	Not more than 97% calcium fluoride	Total	
Hydrofluoric acid and aluminum fluoride	133,000	--	133,000	75,000	--	75,000	444,000
Metallurgical	4,520	8,250	12,800	2,440	3,820	6,260	44,800
Other uses or products <sup>2</sup>	8,170	--	8,170	6,360	3,750	10,100	34,900
Total	146,000	8,250	154,000	83,800	7,570	91,400	523,000
Stocks, end of quarter <sup>3</sup>	74,500	28,700	103,000	56,900	22,400	79,400	79,400

-- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes uses such as enamel, glass and fiberglass, steel castings, and welding rod coatings.

<sup>3</sup>Stocks include distributor stocks (excluding National Defense Stockpile holdings) and consumer stocks for hydrofluoric acid and aluminum fluoride.

TABLE 3  
U.S. IMPORTS FOR CONSUMPTION OF FLUORSPAR, BY COUNTRY AND VALUE<sup>1,2</sup>

	2005		2006									
	Fourth quarter		First quarter		Second quarter		Third quarter		Fourth quarter		Total	
	Quantity (metric tons)	Value <sup>3</sup> (thousands)	Quantity (metric tons)	Value <sup>3</sup> (thousands)	Quantity (metric tons)	Value <sup>3</sup> (thousands)	Quantity (metric tons)	Value <sup>3</sup> (thousands)	Quantity (metric tons)	Value <sup>3</sup> (thousands)	Quantity (metric tons)	Value <sup>3</sup> (thousands)
Containing more than 97% calcium fluoride:												
China	64,800	\$14,300	132,000	\$29,900	44,000	\$10,100	104,000	\$22,000	80,000	\$17,900	359,000	\$79,900
Mexico	10,200	1,800	11,300	2,140	16,700	2,950	9,860	2,100	17,100	3,270	54,900	10,500
Mongolia	13,500	2,560	4,940	988	--	--	27,600	5,600	--	--	32,500	6,590
South Africa	20,200	4,200	17,100	3,410	8,040	1,610	--	--	18,200	4,070	43,300	9,090
United Kingdom	148	23	2	16	2	4	--	--	425	70	429	91
Total	109,000	22,900	165,000	36,500	68,800	14,700	141,000	29,700	116,000	25,300	490,000	106,000
Containing not more than 97% calcium fluoride,												
Mexico	11,400	1,070	16,200	1,680	15,000	1,450	24,500	2,430	6,540	728	62,200	6,290
Grand total	120,000	24,000	181,000	38,200	83,800	16,100	165,000	32,100	122,000	26,000	553,000	112,000

-- Zero.

<sup>1</sup>Imports for consumption include imports of immediate entry, and warehouse withdrawals.

<sup>2</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>3</sup>Cost, insurance, and freight at U.S. ports. Values for some countries have been adjusted by the USGS using published prices and data from industry sources.

Source: U.S. Census Bureau.

TABLE 4  
IMPORTS FOR CONSUMPTION OF HYDROFLUORIC ACID<sup>1</sup>

	2005		2006									
	Fourth quarter		First quarter		Second quarter		Third quarter		Fourth quarter		Total	
	Quantity (metric tons)	Value <sup>2</sup> (thousands)	Quantity (metric tons)	Value <sup>3</sup> (thousands)	Quantity (metric tons)	Value <sup>3</sup> (thousands)	Quantity (metric tons)	Value <sup>3</sup> (thousands)	Quantity (metric tons)	Value <sup>3</sup> (thousands)	Quantity (metric tons)	Value <sup>3</sup> (thousands)
Canada	11,200	\$11,100	12,000	\$12,800	11,100	\$13,600	10,500	\$13,300	8,950	\$12,500	42,600	\$52,300
China	134	92	250	215	409	297	803	518	615	438	2,080	1,470
Germany	112	149	82	163	105	238	77	188	31	64	295	653
Japan	442	1,010	305	686	276	596	407	906	398	819	1,390	3,010
Mexico	23,300	23,300	27,700	27,300	25,600	25,300	25,400	25,700	30,200	30,500	109,000	109,000
Other <sup>3</sup>	151	355	150	384	113	264	271	478	220	367	752	1,490
Total	35,400	36,000	40,600	41,600	37,600	40,300	37,400	41,200	40,400	44,700	156,000	168,000

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Cost, insurance, and freight at U.S. ports.

<sup>3</sup>Includes India, Italy, the Republic of Korea, the Netherlands, Singapore, Switzerland, and Taiwan.

Source: U.S. Census Bureau.